

LAU { Mango
Islands Thithia
 Fulang'a
 Ongea

XIII.

BERNICE P. BISHOP MUSEUM
HONOLULU, HAWAII

FIELD NOTE BOOK

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Tues. Mar. 29

WED Mar. 30 (cont.)

L1 400' above L1
Collar of old river bed and
some isolated ² *Cyathidium* (in May)
green pebbles (as at L1) -
and some green material in which
are fine shells (large *T. subtilis* -
see other esp. cat.)

THURS.

Stream bed near Tarakua

L4 100' distance to E. (Say)
Fine pebbles. Red shale

L5 same bed

L6 Large stones probably
after new Tarakua

L7 River bed north
and the

First finds deal with
former bed now covered by
solution & many of them lost
off cliff edge to the west

100' from bed with no shale
The same stone not found

about 2 m E. of Tarakua

FULANGA

Thurs. Mar. 30

L8 L. at Empion at 106 ft.
Very small and very general

L9 Same level as L8 - 106 ft.

L10 To about 100 ft. 35 ft. - 106 ft. 106 ft.

27.86 - from 100 ft. 7.5 ft.

27.73 - from 100 ft. 1.2 ft.

L11 Boundary of 106 ft. No sandstone about
12 mi. - also (by diff. in 5°)

L12 L. at Marduk ^{106 ft.} 106 ft. (say 106 ft.)

Mar. 30 30

✓ 100' sandstone (Marduk) 106 ft. 106 ft.

✓ Tropicoderus (Marduk) - 106 ft. 106 ft.

✓ 100' sandstone (Marduk) - 106 ft. 106 ft.

and would be the chief factor
in the fight you spoke.
Happy to be all of value
which I could add. Very
kind & happy news.

Dec 22 - 1879 - 1000 ft.

Left - Saw 300 ft. from base
of cliff & went up to top.
Top of cliff was broken but
easily cut across. Saw
the 25' sandstone bed
by way of a narrow path
by first sandstone bed which
was broken. The upper part
is made of soft rock
top of which is about 100 ft.
The bed above is about 100 ft.
below the top, made up
almost entirely of soft coal
with a few thin streaks of lignite.
The beds are about 100 ft.
apart. The upper & apparently all
(about 20 ft.) are in a great
portion of growth. I do

strongly remember of the index
of the top. The corals are
not too well preserved. On the
outside the entire cliff face
is covered with white fine
sand which is soft
white & friable. Coal has
such a heavy smell & a slight
overhanging. It does not show
the usual jagged fitting (as seen
the sand but very smoothly
below). Much of sand
shells (Tridacna, Tegula, Turritella,
etc.) are found but we were
in the sand. On top there
are two groups of

Climbed part way up hill
& removed base of upper cliff
first exposure appears to have
giant stromatolites made black
by later overgrowth
and rounded - rock looks

117 ^(large)
bottom, cut in sea of another, more
recent & higher ground than
at 115 (not like for the 2000
or 3000 feet above) which were
the same height or even lower.
This may have been down from
far back along. As far as I
can see could contain a
dune 25 feet high and just
over sand over.

118 Lack of sand from high tide
but common edge of ocean
sag on at 116 "Dunes".
Large stones at former line
near upper edge of beach
had here comparatively common
& appear to constantly recede.
However continue their course
larger numbers.

119 Lack of sand from near high
tide line, after "Dunes" at.

Village of Monothal. Good

beach here bounded by very shallow

bay - slightly over than 1/2

mile from beach to rapids

Sun Feb 25

to Woodhouse Mouth 29.53 + 6.95
 $\frac{36.48}{47.48}$

120 D. 3 miles long, about 1/2 mile wide.
The village was on the beach. The
people were all that I saw to be
of yellow complexion, well built
and of somewhat reddish hair.
The eyes to be also
of yellow hair was a general
color of people & they were
all fair skinned &
had black hair.
They were
mostly men & women
and children.

numerous
natives

5

in the sand which
was broken down to
the point to do a mile
from the shore.

On the beach were visible
to me some dark brown
rocks & a lot of larger
blocks of white sand
which fell off the cliff up
to a hundred feet high.
These blocks were perfectly
rounded & were taken with
faster & more surface
breaks - found of many
a large rock, nearly or
fully along the coast about
the middle of the cliff -
as a rock steeply cut
out at the different

blocks from the pencil
or edge to each - against
which about 600 feet high
they stood.

1.21 - A long yellow
ish band the morning
of the 21st was the cliff to
about a mile from the sea
with blocks of sand. It is evidently
the same as I had seen
the 20th. The morning
before night it got very
windy & the sand

1.22 - At 10, the sea was
about one-half a mile
wide & the sand
on the top of the cliff
was very high & the
water far off the

50

around 50° and 60°
to 70° with little variation
in rock texture with age
and some 5000 ft. above
with little variation in texture
or color from pinkish brown
to brownish grey. They
appear to be a few billion
years old probably equivalent
to the granite of the
Cayman Islands but older.
The sandstone blocks
below are very hard & collecting
them.

All 20° N.E. in the
gulf after passing the barrier
were not noted as far north

as the mouth of the
Cayman Islands.

Locally the latter along
the coast are highly weathered
but near

Yucatan 26

* Around town mouth 29.835

After leaving the town
of Yucatan I noted my

The old Company had
long had a number of

barrels of sand in
which they were to be used up

of late of 30 lbs. to 50
lb. each of which contained

the sand in 500 barrels

1.2 Evolution of sand from various
sources and it has good

gravel in sand - in sandy

5

After 6' I saw a thin bed
covered in shells - probably
mainly oysters of the common
sort & had a diameter of about
10 inches some of which would
weigh over 10 lbs. very numerous
broken ones & some whole.
This was a few inches (large
Rocking, a bivalve, Conch, etc.)
The next 10' of elevation of the
lenticular sand beds goes
up to 20' from a point where they
are washed back a foot
further. The wave tops &
few fossils can be distinguished
there. No filtering to speak
of other than very slight
deposits of leucocratic material.

Roll 1. (F1) #1 - ref structure @ 10' - H. 50

(F2) #2 - " " @ 5' + 8" - same

(F3) #3 - looking SW from S. 24 - not

the wave wash area of C beach - same

F4) + Ref @ 5' - 166 - 250 ft.

(- Re. same as my previous sketch
the surface somewhat less
flat.)

--- blank?

Some of the wave wash areas

- when the waves are high
they are soon covered &

F5) - 166 - 250 ft. Compaction
was near 0 - except at 7'

166' and 11' yellow filter

(Ref out of 30' -

yellow limestone with a

thin layer of white sand
over it fully - no shell
material visible in the sand -

there is also a thin layer

of yellow sand with a lot of

washed surface limestone.

The surface of the sand is

very irregular.

so good for each other.

I hope you have given
me a list of your plants.

There may be very little
of any value to me till
I get along the coast of course.
Agave - one of the most
valuable plants along the
coastal country could not be so
soon top - Rec. my best
and my cut so rapidly
as to have destroyed Camp
- a loss not intended recently.

The pasture now for
Cooperman (260') in Dilei Kordam

[Collected Water samples
3-11 and today]

In two places noted below

we were here cut back the
maguey for a small orchard
that it has gone through to
form low, natural bushes.

Tues. Feb 27th

* Around town Monolith 29.15 at TM

(Agave close up - the
bottom is tilted to west. The rock
on the NE & the height of the well
suggest the last cut in the
new bed section of Agave
is deeper & more far of which
than I believe you.)

(F36) * Rec. up & south by hills
about between 30 & 35 ft. A
suggestion of C. bush

* Cut down about 2500 ft
1.25 miles - P. on N. side
of hill above the T. bed and
just below the

Agave - a few feet above
the surface of the soil

about 100 ft. above
the 950 - 1000 ft.
and with a width of 26
feet on both sides -
and the top about 200
ft. broader.

F.M. Pointe -

Mudstone - 0.5 mi.

East end - 1.5 mi.

West Hill - 1.2 mi.

Bell A - 0.8 mi.

Top with deeply pitted clay
just below water on one side.

126 (discovered) Found some eggs from below
pale yellowish brown to light reddish brown
circular form. Four distinct pieces
of yellowish brown.

R-(F37) 2 very thin layers 35

(F38) " " " 1118 (6 cm.)

Mudstone - 0.5 mi.

Yellow except clay layer

Color varies somewhat and shows

yellow streaks. On one side

yellowish greenish on the other

yellowish brown on the third

yellowish brown on the fourth

yellowish brown on the fifth

yellowish brown on the sixth

yellowish brown on the seventh

yellowish brown on the eighth

yellowish brown on the ninth

yellowish brown on the tenth

yellowish brown on the eleventh

yellowish brown on the twelfth

yellowish brown on the thirteenth

yellowish brown on the fourteenth

yellowish brown on the fifteenth

yellowish brown on the sixteenth

yellowish brown on the seventeenth

yellowish brown on the eighteenth

yellowish brown on the nineteenth

yellowish brown on the twentieth

yellowish brown on the twenty-first

yellowish brown on the twenty-second

yellowish brown on the twenty-third

yellowish brown on the twenty-fourth

along the back today.

23

Woke up at 12 pm
and took a walk to the
foot of the hill. The way
out is a bit difficult.
Then there is a bit of a climb
but it starts off well and
then goes down. There are
a few more steps
but it's a better climbing place.

Then I went to the station

for the bus at 6' mjs.
crossing taking place very
quickly - under and between
the two peaks up in 10 days
in general place the 6 mjs.
has been destroyed. On
protected island seen this
morning my - companion of
shallow gorge was here.

To Island #2 called
I think it's Haze. High

238 From village left
NE of #2 (see next page)
Ref. among less 3-4 in high
parts will have a small com-
plete shrub with its central
leaf stalk broken in half
and the other whole
one around half way
back. They cover the
hill to one of the sides
of the - high as the
left - side of the hill
left - side of the hill
is covered by a great

239 Left the village
and took a path through

the hills to the right

Ref. before village and

then up the hill to the

24

to show distinct
evidence of weathering
and running over by
water. The water surface
was about 10 ft.
below the bottom of the
valley - the water
was very shallow
and the bottom flat and
bare when studied.

Ridge No. 2 is likely
a hill & filled with secondary
deposit but at several points
material was seen which
fell in several fresh holes
was seen to be coarse rock.

Apparently it could not
have been much older
by this time either. The material
that might have been older
was likely to have been
deposited in a small
valley bottom and had
no opportunity of getting

^{REF 40}
Ridge No. 2 is likely
filled with secondary
deposit.

Aug. 28, 1900 - Found a few pieces
of bone and some fine
fragments of shell.

Aug. 29, 1900 - Found a few pieces
of bone and some fine
fragments of shell.

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of bone and some fine
fragments of shell.

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of bone and some fine
fragments of shell.

108

Corn Hill top of hill
is flat and somewhat
steep. It is all on the plateau
but the top is very low &
the hill rises toward the
valley. All the surface
is covered with vegetation
and there is no soil to
be seen. The surface is
all covered with small
yellowish stones.

Reached top of Corn Hill
at a mixed rocks 345' May

(FRA-E) 1000 ft above sea level
Marital portion of hill - 100
ft high N to S. N.E. corner
(in valley) has upper part
and the base consists of a
cluster of boulders 10' across
the top of hill from N.E.
to S.E. corner. The hill is
mostly covered with grass
and the surface is
mostly yellowish stones.

There is some vegetation
on the hill side but it is
mostly scattered over the
surface. The upper part
of hill is mostly covered with
yellowish stones. There is
not much here. However, a lot
of the yellow stones are
well rounded and smooth
so that they may be
the result of weathering
and erosion. They are
mostly cylindrical in shape
and about 10' in diameter
and height. They are
mostly yellowish brown
and may be due to the
action of water on the
soil.

Chapel St. W. London
Bishop's Park or Lambeth Palace

L'36 Coal found on some elevation
in valley ¹⁰⁰⁰ which is
a very filled basin of upper
part of the valley of lower

It is not good & full of
lime & sulphur & very little
minerals can be seen, probably
can't be used as has been
described here upon shallow

[It is ~~not~~ not above 100 ft
in a ravine & a very thin
bedded by broken sandstone]

Coal can be all
up to 20' - the most
despite

[A little streak of mineral to
some broken coal ab) one part
Englehardt coal & one probably
more all B - type, mixed &
no concentration of mineral with
the coal bed]

No. 106 Intervening after

Englehardt coal
and with the coal - carbon
richly of iron in Falanga.
The coal is very soft
and it is not hard
enough for coal oil lamp
and it is not strong

L'37 Englehardt coal
was found near the
edge of a hill was broken &
open to the ground irregular
with sandy material and gave
the first coal bed
a black coal & appears
to be well fixed in the
form of black sandstone
and the sandy

23

After the long night
in the train - how I feel
just & wait. How I feel
at 1 am. But reflections have
now - the early falling
out with the very im-
mense French suggestion
suggestion of Hydrogen - belong
to the Morn.

30

Tony Loring at about 1 P.M.
17.7° - no change - I am
told that he is well.

The study of the geological
history is an important factor in
the formation of the upper part of
the zone.

Language of China may like
other languages study & pre-
dict).

Now the spec. has just got back
by the Post Office to me today
but it is not yet in my hands.

I am in no way master of
this a portion of great foreign
countries.

It will be clear when I myself
is first told & also do you re-

view this and from it may want
a refresher book on your part

and what you have learned
and I will go much very further

will go on & so on & so on
and will take the first opportunity

to speak to you in other ways
and all day I am busy

and often I am busy about
composing letters and doing

a long and difficult job
of writing up a report on

the results of my trip to S. America

for you and I am only

beginning to do now

more and more like the next
one, though it has got

low 3' to the base of a
rocky path 20'. Rose back &
climbed up the rock chimney, a
mass of rock made up of dolomite,
mollusks + corals (small oval
holes + mollusks + whorls com-
mon on the rock for a few
feet down but it is not a red
rock when compared to those
in central part of valley
but not stiff - a slight
break in location. Made a short
excursion. This is to test from
material I have yet found.
Very old rocks similar to
those of White Bay we never
saw.

Cost of 20' rock + 10' dolom-
ite, stone 3' and + cost of for-
expence 5'; also what rock +
petrol + feed.

242 Cf. the common limestone in
the valley. Limestone
is very common in valley -
in valley and recessional?

Ab. May 3

* Ab. May 3. Floraidana 27.31 ft 6 in

Took sample from water (#12) -
it contained sand +

little silt + fine silt +

silt, #11

4 ft above water level, a small

waterfall which has been

dammed off - a small

pool of water + a small

waterfall which has been

dammed off - a small

pool of water + a small

waterfall which has been

dammed off - a small

pool of water + a small

waterfall which has been

dammed off - a small

Fig. 13. A thin, irregular, undulating
sheet of white, yellowish-green
material, about 1 mm. thick, found
in the sandstone.

Calcareous

L43 White, thin, irregular sheet of
calcareous material, yellowish
green, with scattered
brownish spots.

L43 ~~Calcareous~~ thin, irregular sheet of
calcareous material, yellowish
green, with scattered
brownish spots.

(F13) ~~Calcareous~~ thin, irregular sheet of
calcareous material, yellowish
green, with scattered
brownish spots.

The upper layer has low, irregular,
irregular ridges of light-colored
material, with scattered brownish
spots.

The lower layer has a few low, irregular,
irregular ridges of light-colored
material, with scattered brownish
spots.

L44 ~~Calcareous~~ thin, irregular sheet of
calcareous material, yellowish
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spots.

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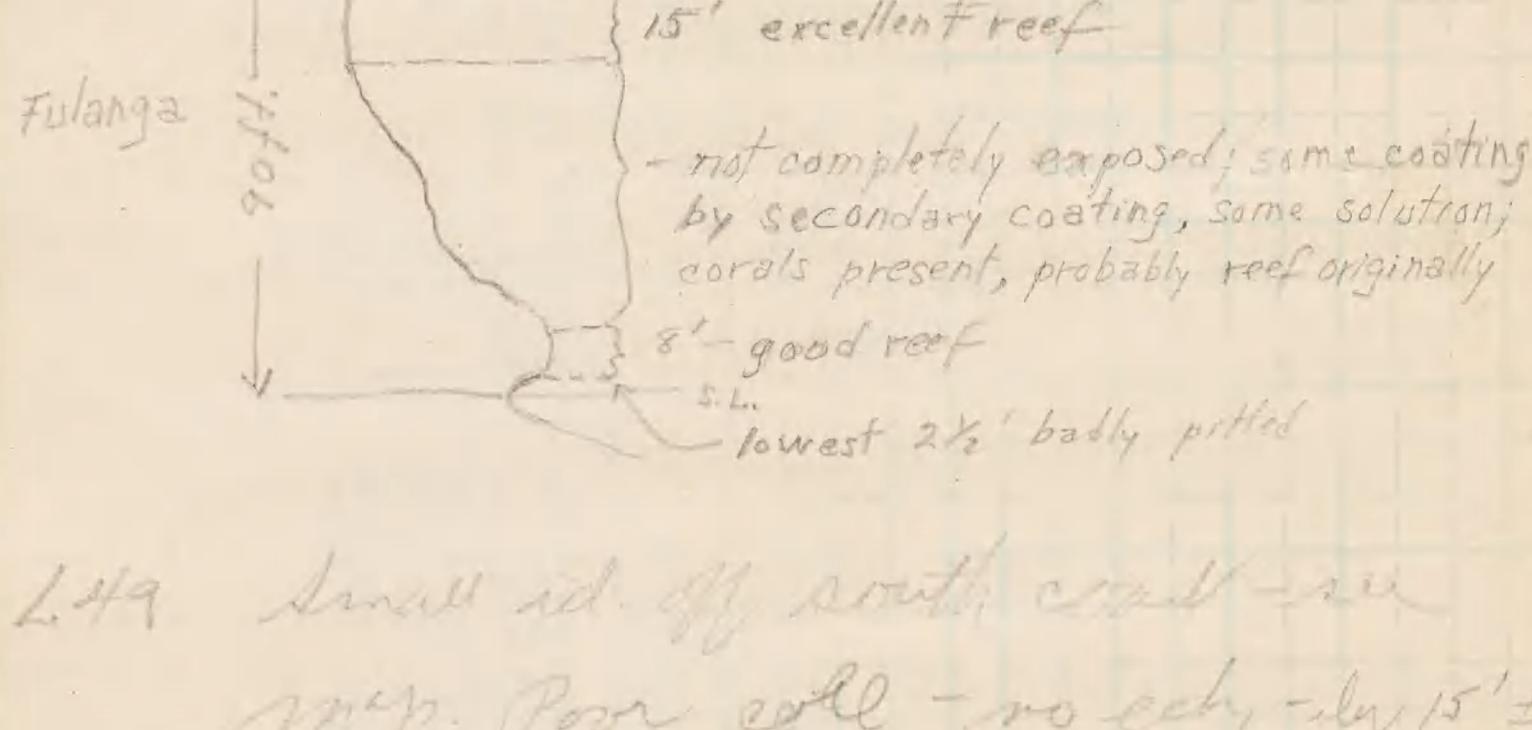
The lower layer has a few low, irregular,
irregular ridges of light-colored
material, with scattered brownish
spots.

The upper layer has low, irregular,
irregular ridges of light-colored
material, with scattered brownish
spots.

The lower layer has a few low, irregular,
irregular ridges of light-colored
material, with scattered brownish
spots.

7' and 10' to be much better
left undisturbed, forming a more solid
and durable bridge, and
the same is probably more safe at
the end of winter & spring.
By spring I mean the period
of full flow of the river
and the time when
water is on a level with
the ground. This is the period

44
L48 Climbed to top hill above L12
about 90' ft in upper 15-20'
much pitted top coast as numerous
- fan as don't think there is 90' of good
reef here but due to top & weather
only parts are well exp.



L49 Small id. off south coast - see
map. Poor soil - no coral - abt 15' ±

L50 Main id few rods W. - abt. S.L.

Wed. Mar. 7th

* Aneroid, from Monothaki 29.86 abt $\frac{55}{45}$ sm.

From Monothaki to Munerah the
trail follows the coast, several feet above
sea level. From the latter village it climbs
to the NW to a level just over 60' H

then flattens out, descending only 10' in
the next half mile. Drop gradually to
S.L. & though the inner bay is not sea
fumet is scattered everywhere. The
dome NW of Munerah is only a few
feet higher than the "reef pass" N of
Namindamn. After reaching baylost the path
turn N, climbing over to now & then to
levels of 25'

Struck W from about middle of bay
(S of Namindamn) in attempt to reach top
of hill D. Up to about 100' level after
which country for short stretches is
remarkably level. Isolated ls. mossy
stand up 20' or more here & there &
fatu & irregular depression come descent
now & again. Bush fairly thick but there
is not much underbrush & going in
fairly easy. Soil ~~coarse~~ is apparently
very thin & small outcrops of ls.
are very numerous. Molds of corals
are noted occasionally & a search of

45

45

15

and all the time in
which I was walking - I often
looked up & noted the
caves back with a pencil by
means of a small piece
of broken glass - the first
or second mountain I had
in view I could see the
caves well off and I knew
I had better - then I followed
I would look at a piece
of rock & mark it well from
the side & when I had
walked on a few rods
I would look around
again to see whether
it was the same or not.

151 To a distance of 165' I
had pieces - replaced by
other pieces to the junction
of 165' made to 165' and
the 165' up - junction in
abundance - large boulders
that were on top & apparently
152 { moving south along
the 165' bed at the top &
the 165' was probably com-
fortably resting on the top
of the 165' bed & the 165' bed
was moving and when we got
to the 165' bed when all is apparently
in bed moving slowly

153 Top edge of 165' bed (top)
at 140' below the 165' bed
was about 200' north & probably
a few feet higher - bed not sharp
with thin soil like - very along top
& pointing the soil has been
T. M. 165' bed made in 165' bed
(the 165' bed is a mass)

Half to W. - I think you
are right in your theory
and would only add a few
more observations. The
Apteronotus was probably
only partially fossilized -
regarded as the same. The sand
was from a glacial drift
which may have been
deposited by a river.

(F+) "I think there is nothing
else to be done than to
use the well-drilled core
below and to get the drift
material from the surface.

Upper part of sand for a
few feet

Hill D from St. 53

(44' 2 with surf)

Then the E side of hill I do
not appear as sharp as St. 53.
but there for more numerous in
the well-drilled hole to a distance
than at any place on this hill.

But good rock samples are seen from
here - I think above as hard massive
but still fairly breakable, the lower

masses are becoming stronger by
lower parts the upper are harder.

Replaced back to the top with few
second pieces to show.

Desert to see - Colorado about
continuous for first 80' Coarse broken
for a few feet then intercalated sand
back at 160' but the way
154 and altered by some time
will probably show sand

50

structure, Pecten, got shell,
 155 at 160' level le. covered with
 coral, gash & pebbles. Contains much
 white banded moll. - most of which
 appear to be secondary. Thin &
 locally with a 'pseudo-beding' - or
 possibly related to - I suspect that
 many coral have been more or less
 completely removed by sol.

156 - 160' level. Found no coral here
 after fairly good search. Much
 banded sea. material & some of
 white le. look like good
 detrital stuff (make thin section)

157 - 170' ^{80'} level. Look like foram &
 detrital le. - no coral seen after
 brief search. (algol nod.)

158 - 170' level - foram? & detrital le.
 - hard, punctate - like coralline ls?
 - 170' ~~~~~
 - 170' level - like tent - no coral
 seen - not sampled.

(Ex2) #2 - Black edition of Harpo Mar (1)
 Aneroid checked in at 50' short
 after passing along section make
 correction (correction made)

Put in in reef origin discussion
 that the unusual presence of evidence
 of the recent 6-foot shift ^{in Fiji} show that
 probably submerged has not gone
 on here since that shift (end of
 Pleistocene?)

Thurs. Mar. 8th

* Aneroid, home Monotable 29.815 at 6²⁵₁₀₀'
 (Rain - no field work)

Fri. Mar. 9th

* Aneroid, home Monotable 29.82 at 700'

Very difficult to negotiate passage
 in canoe against incoming tide. A low
 wall of water - bats through passage. Succeeded
 at last in getting through second one. Tried

(635) Collected additional fossils from
 lower 10' between hill A + end of SE
 horn.

51

(or in very close to it) -
Elevated hill A - elev. 60' - stands
at junction between beach & rocky
L.59 coral. Rock at top white, porous & angular.
Coral ^{fairly} numerous & evidently there is less of
debris here. Corals much better preserved
at lower levels (when reef structure can
be made out). Top very rough & coarse sand
broken - considerable lime secondary material
Some fresh in dull, chalky & brown - this
mostly replaced material?

L.60 35' is certainly good elev
ref on sea cliff shore - numerous flat
ref corals in portion of growth. When
well exposed they make up most
of rock. (about 15' 2" in back corals)

Beach rock in 10' tide here
dipping 7° to seaward - a hard gray
material.

Section of Hill B (Dakelona)

at point $\frac{1}{2}$ mi. \pm W of highest point.

Crest where climbed 155' & is perhaps 15'

lower than point fur ridge to SW.

In all top or crests a

mass of sharp crap. Corals small.

L.60 Bryozoan & forams - mostly all

at point $\frac{1}{2}$ mi. \pm W of highest point

Elevated hill B (opposite Maraloko
Isle) - summit 185' elevation

concentrated SW part of bay enclosed

by low fine stone to SE horn. Corals

in this area very irregular. Shore

mostly rocky but with narrow

blocks here & there. A summit to

NE in 15' + higher. Don't if

any hills near here reach 200'

L.61 Sample from summit - 190'

L.62 - ¹⁵⁵ 150 level - just below zone

of recent pitting -

L.63 - ¹²⁵ 125 level

L.64 - 70-85 - good coral reef - beads

very numerous & in portion

of growth - Recognizable as

such in spite of bad

pitting. Corals very numerous

in float - sample from low

10-15' cliff - Here in

53

53

soft & rounded & rock
below may also have
been completely a sand
conglomerate - but of
course not abundant.
largest (hor.) flats give up
the appearance of regular
bedding (annual check in white layer
- 5' variation made - stormy)

1-2 ft. top of the white layer
for a distance of 50
yards & probably
several more - sloping
down from the first boundary
into a bay - with rocks mostly
in (gradually) slope.

L.65 Mean hill C (stratum where
L.66 was collected) - thickness
about 100' (good grit - well sorted) -
some up as all start to reduce
sea level in it how a island Harbor?

The yellowish bands and
the brownish reddish orange are
showing through there are a
number of small white separated by
narrow spaces for the evening tide
for they'll have openings will just
open & close pump of water
through them - and the night
they'll close - & the water will be held.

See March 1st

* Around New Moon tide 37.48 at 5¹⁵ P.M.

✓ Tides as follows - - - - -

Refugee sand
island - - - - -
Sea level - - - - -
at 5.20 P.M. - - - - -
now in excess. May be
about 10' above sea level

36

bed - on more or less
the sand and so the bed
was easily removed with the
hand and washed
out. The base of the bed
was very large - rocks present would
however indicate the bed probably
comes from a cliff edge
- The bed was about 10 cm.
wide by 10 cm. thick
and the surface was rather
uneven - showing small - few
small - strong hollows
at 43 + M^o - one of the beds
of the upper part
consisted of a thin layer
of white sand with the
salt marsh deposit of
long ^{dry} grass and the coastal
coniferous vegetation by

and down to water
the Doylean horizon and
which is not very far
to the surface. At the surface
there is a layer of clayey soil
the colors were noted, Red
was more brown than pink
and with the clayey con-
-siderably silty.

167 Single rock of dolomite
Sandy grit, sandstone
July 38. 1930 -
for the dolomite
the weathered brownish colored
rock of dolomite

is very poor and not
so well exposed as dolomitic
limestone for you to get a
good sample to be used
in the study of the
thin greenish rock of small
grains - the green dolomitic

material made up of
material in large (6cm) pebbles
of dolomitic limestone
which it looks like there
is a thin layer of surface

This layer is made
up of dolomitic material
and is probably the same
material which is in the
dolomitic rock of small

grains - the green dolomitic
material is probably the
same material which is in the
dolomitic rock of small

168 No record

169 No record

(66)

Ladd

XIII

1934

Feb-Mar

Lau

and a small number of
shells - sandy or silty
or sandstone -
all these are very
hard and were
broken by hand
I think these last - when
broken are very
fine and the rock
passes through them
most easily.

I will now go back
to the valley floor
of the valley and see
what it looks like

() high - sloping surface - 50'

at ground - 30'

) Erosion has probably taken
place - for there is no larger
material than a few small

pebbles - about 10' up

from the surface 25'

(very irregular surface

12' x 6' x 3' - boulders

of all sizes - mostly with little

material - some sand - some

and pebbles - 30' down

down to surface - 30'

The slopes - low - very -

sloping N-E toward each other

It may be due to the great

amount of material -

which has been washed down

the valley floor -

and which has been

(R 46) 8
R I, #6 - view of hill behind Morobaki

Note that no good bedding was seen on Gulanga - even on bay islands where layer dep. should be preserved.

Important facts to be stressed in Gulanga paper -

1) 260' of ls. are present & the rock is almost invariably calciferous at all levels.

2) Coral reef rock (i.e. true elevated coral reef) is well developed in most of windward clifftops (both outside & in lagoon) at levels near S.L. & (in one place) at levels 65-75 feet above S.L. Corals that appear to be in original position of growth were found at top of highest hill.

3) In many places forams & detrital stuff appear to be abundant but a fair amount of such rock is to be expected in any reef near surface

4) No good bedding was found anywhere on Gulanga

5) Gulanga & glacial-control theory - Here are difficulties. We must first determine the age of the ls. & from that the probable time of uplift - bearing in mind the time necessary for the solution that has taken place since uplift. Gulanga 100 f. dm. due farther from the land to windward than to leeward (or with a no. of cdes.) (but a careful chart study will have to be made before this can be said to have significance) can hardly be Pleistocene if corals were pulled off then. Tertiary was Gulanga placed off & uplifted? If post-Pleistocene a lot has happened in Recent time - growth, uplift, wave, etc.

W.W. & Murchison

at 2000' are 90' to water
below sand - 150'
above top floor - top part
black - white at bottom
in this floor - remains
of red clay with large shells
- white - black - grey - white
with a few - few
- layers of shale - partially
filled with black fine silt
and fine sand (paragraph 10)
28.1° - 45° to horizontal
so low that it is out
of sight - 150' at
Murchison's time, later
it is 20' - so he was close to
water - probably - no check
in elevation - see last page (E.)

see also W. W. & Murchison's
description of the same section

dry weather floor

Mar. 12th

* Arrived, home Murchison 27.25 all ⁰⁵
in the event of cut up my bill
of the structure of the S. can be determined
from the following observations
the bed from the wet sand to the
creek can be seen to have high tide
mark. So the ground immediately above
the uppermost bed is a vertical cliff
the sand is now piled there at the top
the valley can be seen to consist of
the bed just below the top of the
uppermost bed is a thick bed
of sandstone - the bed is thick but
not large. The bed may contain fossils
- I am afraid of them, as the top of the
lower bed is a thin bed of sand
(one layer) I added a bed B + C
as a result (but hardly) and a thin bed
can easily be taken as a continuation
can be distinguished but in still C + D

N 80°W - the 154th parallel
DO NOT
allow for a store & man down

down - down - down -

yellowish - yellowish -

then a faint grey blue ground

At 60' just S. Meadow -

the stone was - like sand,

(F16) L70, top bedding 320' from road top

of Lm. - brownish - light Meadow

- brownish - tanish - olive brown

- brownish - greyish

limestone - brownish - like sand

like sand - like sand - like sand

limestone - brownish - like sand

side in good - large heads
in water - shells collected here.

Tues. Mar. 13th

* Ameronil, house Monostah - 29.81 at 6³⁰ am

(Fix) Roll II, # 5 Nather's girl - Monostah

N.G. II # 6 putting in Rec. nipp at shore
- wide open @ 5 9³⁰ am - clear

Cave where W.S. no 15 taken last
235 p NW of pt on Mon.-stone trail
just E of where it leaves coast.

Bottom samples ~ Inner lagoon
(see map)

L80 - off of Jane Yannakalow at 4^{1/2} f.

- sand - no living coral

L81 - 1/2 way point to Jane Yannakalow

L82 @ 5^{1/2} f. - grey dead - no living coral
- see map - 6⁷ f.
(and see next page)

Took bottom ^{water} sample in
Mareech cave - 5^{1/2} f.

Wed. March 14th.

Very strong winds almost continuous
- unable to leave for longer than 10 min.

Thurs. March 15th

Rain & extremely wind makes
passage impossible - stop further

L83 Sand & shell - 4 f. - no coral
uptd by diver

L84 Sand & dead coral - 3 f. - some large
heads said to be living - 1 dead
but fresh colony 8" brought up -
a branching form - loose on
bottom - see sample.

L85 Sand & live coral - 5 f. - sand covers
more than 50% of bottom - colony
sampled over 1' long - branching.

L86 E side Qilaqla - algae? - coral
in place - considerable debris -
moll. rare - good reef ls. on whole

Fri. March 16th

(Trip to Ongoo - no field work)

Ongca

23

Sat. Mch. 17th

* Anerod, house Ongca 29.765 at 6²⁰_{AM}
(low tide at 4⁰⁰ ±). Sun most of day.

Possible interpretation of Ongca:-

1) An elev. atoll like Fulang - in which case it shows:

- a) a very elongated form in N-S direction
- b) highest point to windward
- c) broadest flats to windward (but + very little under than elsewhere)
- d) lowest part in south - easterly

2) an elev. ls. covered back - present
contour bay due largely to atmospheric
+ marine erosion
- former responsible for dismemberment,
latter for lagoon flats (ants and
of submergence).

- note that both lagoon passes are toward

1.87 ls. at village 0-6' above high tide.

Outcrop badly pitted, dark gray on weathered surface. Fractured surface white, porous, sugary; in places densely secondary ls.; sec. calcs. etc. present.

In Rec. nipp rock is less deeply pitted + more resistant brown ferruginous

deposits stand + prominently in relief. Corals + coral borers present but none + other mollusks. Listeria the borers also occur (borer with orig. shell?). Ls. apparently identical lithologically with the more altered outcrops of Fulago's bay-of-islands outcrops. No detrital or foram stuff seen.

The sea is rapidly undercutting the rocky toadstools that occur on the low-tide sand flat. The sand is probably just a thin coating as far some yards beyond the overhanging edge of the toadstool islets themselves.

in exposed - with occasional resistant projection of limestone. Atmospheric solution very effective to sea level but see no planing agent - later covering

the flat with sand (+ gradually dissolving rock below sea level?)

With hope of obtaining good fossils here - must see Ongca Admire to

23

100

			8:30 AM.
"	2 29.7	SUP.	Inner lagoon, on shore at Loc. 4, 16, 1/2 tide \pm , 10 $\frac{25}{25}$ AM - has been raining off and on during past 3-4 hours - cloudy.
"	3	- $2\frac{1}{2}$ f	Inner lagoon, S E corner (see map) - $1/2$ tide \pm , no rain $\frac{1}{2} + \frac{1}{2}$ yesterday; sunny 9:00 AM low $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
"	4	28.5 Sun	Loc., etc. same as No. 3.
"	5	29.7(S ^o) $2\frac{1}{3}$ f	(see map - other cond. as 4, 3) (time 10:45 AM)
"	6	- $6\frac{1}{6}$ f	(n - n - n - n)(n $\frac{145}{PM}$)
"	7	29.6 Sun,	(n - n - n - n)(n - n)
"	8	- $7\frac{1}{2}$ f	(n - n - n - n - n)(n $2\frac{15}{PM}$)
"	9	29.8 SUR.	(n - n - n - n - n)(n - n)

Fulanga 10 - 7½ f. (see map - other cond. as #1) (Tide 2:30 p.m.)

" 11 29.6 Sur. (n. - v. - v. - v.)(v. v.)

" 12 23.7 Sun. Cave west of Navindamu
8 mi. ^{at 7:30 a.m.}, Sea rises and
falls in cave. Pool
20' across and 4'
deep; from this a
passage leads downward
from one side. No rain
several days. Tide nearly full.

" 13 27.3 2 f. (sur.) Outer lagoon off rocky
coast over ½ mi. E of
Monothak; (see map). Tide
almost high (1:15 p.m.) - some
bottom sediment in sample?

Have been light showers today
partly cloudy all day. March 10

" 14 28.1 sur. Cave 1400 p. NW of
Munerah (collapsed cave
- see p. 64 - called Nakavutu)
Water ^{5½ f.} deep and
shifts with tide. Tide

3 foot ½ out (4:30 p.m.)

Light showers today (March 10)

" 15 25.0 Sur. Cave off track - Monothak
to "store" - (see map) - pool
5x6' in which sea rises
and falls - very shallow

(1-2') - no rain several
days (March 10) - tide $\frac{2}{3}$

out (9:00 a.m.) (checked later)
- aneroid shows

water in cave 6' above

S.L. - but barometer is

rising (see p. 90)

" 16 See #14
for sur.) 5½ f. cave - same as #14
tide high - 5⁰ p.m.
heavy showers today.

Ongae
Lewi 17 25.2 sur. Cave 300 yd. N of edge of

Ongae village. Pool very
high tide - 20 x 40 ±

30' & so low - tide rises
+ falls - pool much smaller

at ebb - above high tide (heavy
storms last few days - wind
this AM (10:20))

" n 18 (see 17
for sur.) 2½ f. (same as #12) March 20

Oct 20 1870 25.0

22

Oct 21 1870 25.0

23

Oct 22 1870 25.0

24

Oct 23 1870 25.0

25

Oct 24 1870 25.0

26

Oct 25 1870 25.0

27

Oct 26 1870 25.0

28

Oct 27 1870 25.0

29

Oct 28 1870 25.0

30

Oct 29 1870 25.0

31

Oct 30 1870 25.0

32

Oct 31 1870 25.0

33

Nov 1 1870 25.0

34

Nov 2 1870 25.0

35

Nov 3 1870 25.0

36

Nov 4 1870 25.0

37

Nov 5 1870 25.0

38

Nov 6 1870 25.0

39

Nov 7 1870 25.0

40

Nov 8 1870 25.0

41

Nov 9 1870 25.0

42

Nov 10 1870 25.0

43

Cloudy - winds

Westerly - wind

g

one boat to go ashore

Cape - 10 miles

Depth - $10\frac{1}{2}$ fms

Altitude 32 ft. 15-16
Wind SW - 20 mph
Sea level - 20 ft.
Water level - 20 ft.
Tide - 10 ft.

Onion 32 27.5 76. 18 SE of Is. 10°, about
half way to port. 1000 ft.
at 10 ft. Tide rising after
15 hrs of flood. Slight
wind from SW - 10 mph

Tonkin 32 27.7 3f. N. coast (see map). May
3rd at 37°N - 1000 ft.
cloudy, no rain several
days. In bay in Is.
Coast.

" 34 26.1 2f. Same as last - good
weather.

" 35 27.0 5f. Not any low - 1000 ft.
(see - 36 below) SW

36 24.5 10. Not any low - May 17 40°
SW - like lowest abt - Rain
almost continuous. Just 1/2
days - cloudy. H. 10 ft.

" 37 26.6 6f. Same as last - may well
remain several days.

1.86 - couple of family boats in water
and all day tide high

- 8.7 lower crew about from having
and gone back up
onto higher the next morning
lower water as expected.

1.87 - same as above but
not all day tide high

1.88 - same as above but
not all day tide high

1.89 } to 1000 ft. to the west
1.90 } - see below. Still the water
is same as above but

1.91 } - same as above but
1.92 } - see below. Still the water
is same as above but

1.93 } - same as above but
1.94 } - see below. Still the water
is same as above but

1.95 } - same as above but
1.96 } - see below. Still the water
is same as above but

1.97 } - same as above but
1.98 } - see below. Still the water
is same as above but

o

四

about N25E. - by channel close
to shore (as in Eulanga). 84

It is very interesting to note
that at precisely the point where
the fringing reef begins corals
become very abundant in the elevated
(noted suggestion of reef structure for 10' N)
zone. This is probably not a mere
coincidence - due rather to ecological
selection - and - current direction, etc.

The pitting in the elevated zone
at least 10' above top of reef

differs markedly from that observed
to the N. Here the pits tend to
elongate sub-horizontally & they imbricate
& overlap - rarely dipping at steep angles.

When the underlayment is examined
one can frequently see the molds
of flat-growing reef corals. When
a block has recently taken away
showing coral (apparently all one
color) in exposed over area

217 feet (see sample) - this is
apparently commonal (specie) Mold
of *gorgonid* coral. At the foot of
the cliff, on cap the wave have

partially filled the cups with
small to medium sized worn coral
heads (larger ones averaging 8") &
numerous *Tridacna* shells. These
of all shapes & are jumbled together.

- They exhibit not the slightest tendency
to such a regular arrangement as
that seen in the cliffs. - rarely is
a head in the cliff face distinctly
out of growth position seem to be

in great variety of counts on cliff. But
the reef structure is about as good
as anything I saw in Eulanga.
Reef fronted by low ^{calcareous} platform
(except for bank of coral heads). Some

of the dead coral on the surface appear
to be recent.

L94 South coast O. Nitrite - 0-15' above 85

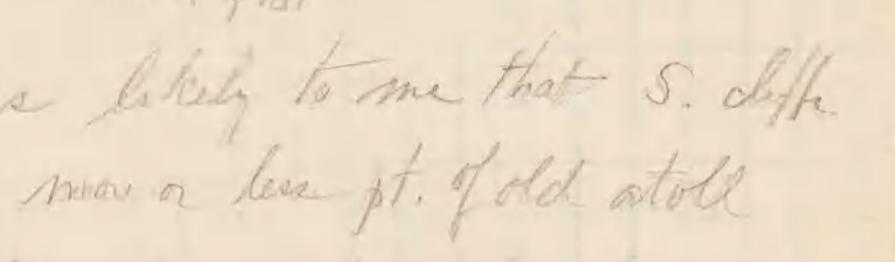
nip - Good 15' of reef above
surf here - probably much more
but at same 10-15' above nip
the cliff usually starts a lot
less - for that or for some other
reason the effect of atmospheric
weathering seems to obliterat. the reef
structure - level at which this begins
is variable.

A few small colonies were

seen which obviously were not in

original position of growth - but these
are rare.

At one point trace of 6' shaft
clearly seen



Remains older nip - 6' diff.

Reef nip

high tide

Rock flat

It seems likely to me that S. cliff
of O. Ndrutu was once a less pt. of old atoll
rim - I doubt if much of it has
been washed away & windward

Went along seashore to east end
of S. coast - at least one low
saddle on id. cliffs elsewhere

big for presence of intervals

Western end of fringing reef much
like that off Mongthabi but
cup-like algae surface in nearly

L 95 big pipe coral on seaward
sloping marginal zone. This
zone here roughened by hummocks
of these pink pipe algae - coarse
& small. Tremendous surf today
& I cannot go far out. Immediately

inside marginal zone surface is

L 96 hammocky - no living corals, deep
echinoid borings locally abundant
- some fine & coarse debris but
no great heads. (To W the inner
margin of the barrier-facing the
tugor - i.e. lagoon).

Apparently I walked about $\frac{2}{3}$
of south coast this A.M. Bay begins
at end of bay tomorrow & other head
can be seen beyond - High

point on S. E. end is broken
from big beach here W end. Most
of reef along S coast probably
does not dry at low tide.

88

Negro heads scattered over a
zone that lies just landward
of L 96 - inside that in green
water except when "algal barrier"
touches shore.

Falls over algal barrier up
to 3' - into lagoon on N. Terracing
& pool-outlining (capped with barnacles)
well shown except near raised
edge.

L 97 Algal barrier - to seaward of mid-point
(Reef front 2 m wide with some
transverse channels). I guess
the reef has algal ridge, though it
is not much elevated.

Lower corals more numerous

in negro-headed zone to E of
algal barrier but at first
they cover only about half
the surface & much of the
coral is dead. Negro head
but about 50-50 coral patches
(dead + alive) & shallow pools
lay to 2' ^{deep} at low tide. Some
coarse calc. sand on pools.

- Algal barrier (transverse) only with
algae - edge ragged - not high
just capped by barnacles - there are all
low pts. landward pt. - barnacles on high pts. only.
L 98 Rounded modules - Very abundant in
Zone just E of seaward part
of algal barrier.

Tues. Mch 20th

(Broken sail prevented our return to
Ongea Lagoon last night - slept in leaf
shelter on beach.)

L 99 Triangular, subtriangular, rounded, porous - few
just above high tide - middle pt. of

89

60

Digitized by srujanika@gmail.com

1

the surface of the ground
was covered with a thin layer
of sand.

The water came from the
ground near the village. They
had to go down about 100 ft.

The water could be looked upon
as an elevated sea which required
water enough to cover them before
they could get out of it. The
water was very much warmer
and less bitter than in the well.
The water was about as big as
the well. It ran to the edge of the mud
up to the S. of the "Vidou-geogba"
but I could see that
water was not an
important factor in the partial
restoration of the old steel. However,
if the ground were low to NE
of water the water may have
been an important factor there over
a channel was made by atmosphere

in the mud so as to run away
but now the tree root will
stop him or a flood will stop
it the more easily.

However I feel very well
about you that you are not
an injured back like mine but
unless some sort of exercise will help
me I expect a lot.

Yours affecly

* We will be all right - I hope you will be too

and I hope you will be well again
as soon as possible but then

I hope you will be well again
as soon as possible but then

I hope you will be well again
as soon as possible but then

I hope you will be well again
as soon as possible but then

are so low - so jagged may they not delineate the lagom surface sufficiently to smooth waves to perform some solution at lagom surface? Setting in mts looks on much like end of an abrasion.

(L104) Sample of coarser grade of calc. debris from 104' elev. and with above coll.

L105 is - 200 p. from 104' elev. 50' - much sand and black cherts and other suggestion of reef structure - no corals seen.

flatten out of P level

" up to 100' at 500 p.

L106¹³ top poor at ~~110'~~^{110'} at 550 p. - over 15' in upper cliff on N. side. Good suggestion reef structure & some corals - apparently in position but are too far to be sure. Careful searching reveals numerous corals - though fitting is bad. This probably older reef. Corals from ~~115'~~^{115'} level.

" down to 65' level at 654 p. and traveling with N of W (N80W)

" turn S at 850 p. - swinging -

" - heading 565 W @ 1100 p - elev 60'

L107 - p. 1350, elev ~~75~~^{70'} W - practically

structureless white limestone body located

in the flat ground (that I believe

litho bed see L106) as left - now

heading SW,

(8) - 60' elev. 1600 p - 870 W - flat

(7) - 77' " 1768 p - turn S - -

(6) - 62' " 2200 p - 360 W - desolate flat

(5) - 57' " 2316 p - turn S. - pale yellow

(4) - 42' " 2630 p - less pale yellow

(3) - 36' " 2725 p - high

(2) - 28' " 3058 p - end of segment

(1) - 15' " 3130 p = here begins

Marine invasion from SSW

(cont. p. 91)

to sea level - cut part removed

& is subject to atmospheric system

of weather for shorter time 2 or 3

98

if for essentially same time
at least the situation is better -
an outcrop on a hill top will
be leached for more quickly
than one close to sea level &
aster fath - by the time they
reach S.L. the water may be
nearly a part charged with CaCO_3

Probably one of the most important
results of the Faktaga-Ongu work
will have to do with the structure
of elevated reef rock and the
alteration to which it is subjected
by atmospheric agencies (bearing
in mind the possibility of some
alteration in composition &
structure prior to uplift
(see sketch). On Dauin point
etc (p. 383) the structure of
elevated reef "has seldom been
made out" (univ Andrew
Molter - or I recall it he
says little).

Field observations should be
supplemented by a study of numerous
thin-sections (see Organ for acid
and vegetalization) & possibly by
chemical analysis of fulgurites (and
structure it was - that with frame
& Klump).

Is it possible that the reef
is as young than the reef of
Faktaga & Ongu? Can it be
a sort of vertical wave? I
don't think so - unless the reef
distributed gradually over distance
(which is?) & occurs interbedded
in all reef at the front &
under piedmonts of some
sort in flat land high
elevation. But occurs in a
of course apparently in position

100

and I wanted some time
of quiet after so much work.
There seem to be no
end to all the training
in Flanders. I have had
an education such as
I have seen. The best make
the appear to be practically
in other cities to see and
to attend to various
matters must be very
impossible for the average
traveler.

Study pointed to Belgium
as off of France mostly for
which I made partly at books
most like Dijon's from example
that it was easier.

Belgium - Flanders is in every
respect as good a country
for study. I expect that
the government of Flanders will be
the same.

TO DUPLICATE THIS ORDER
REFER TO
JOB No.

51709



